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Claims

[c1] 1. A photolithographic sub system adapted for use in a photolithographic system for projecting light onto a resist covering at least a portion of a substrate, the photolithographic sub system comprising:

a container having a membrane which has optical properties suitable for light transmission during a lithographic process; and

fluid substantially devoid of contaminants, the fluid being fully contained within the container such that the container prevents the fluid from contacting a lens and the resist.

[c2] 2. A photolithographic sub system according to claim 1, wherein the container includes:

a top layer that is substantially transparent to light; and

a bottom layer that is substantially transparent to the light.

[c3] 3. A photolithographic sub system according to claim 2, wherein:

the top layer has an absorption of less than about twenty percent of the light; and

the bottom layer has an absorption of less than about twenty percent of the light.

[c4] 4. A photolithographic sub system according to claim 2, wherein the container is a fluid-sealed bag.

[c5] 5. A photolithographic sub system according to claim 1, wherein the container is a compliant container.

[c6] 6. A photolithographic sub system according to claim 1, wherein the fluid is a liquid having a refractive index greater than the refractive index of air.

[c7] 7. A photolithographic sub system according to claim 1, wherein the container is shaped as one of a pillow shape and a cylindrical shape.

[c8] 8. A photolithographic sub system according to claim 1, wherein the fluid is substantially transparent to the light.

[c9] 9. A photolithographic sub system according to claim 8, wherein the fluid is a liquid having an absorption of less than about twenty percent of the light.

[c10] 10. A photolithographic sub system according to claim 1, wherein the fluid is comprised of water, deionized water, or a liquid based on perfluoropolyether (PFPE).

[c11] 11. A photolithographic sub system according to claim

2, wherein the top layer and the bottom layer are comprised of one of an amorphous fluoropolymer and a fluorplastic comprised of tetrafluoroethylene, hexafluoropropylene, and vinylidene fluoride.

[c12] 12. A photolithographic sub system according to claim 1, wherein the fluid is a purified fluid.

[c13] 13. A photolithographic sub system according to claim 1, wherein the container includes a collar which conforms to a lens of the photolithographic system.

[c14] 14. A photolithographic sub system according to claim 1, wherein the container includes:

a top layer;

a bottom layer; and

a seam defining a junction of the top layer to the bottom layer; the seam being located around a periphery of the container so as to not interfere with light transmitted through the top layer and the bottom layer.

[c15] 15. A photolithographic system according to claim 2, wherein

the bottom layer is sized to cover at least a portion of the resist; and

the top layer is shaped to the contour of the lens.

[c16] 16. A photolithographic system for projecting light onto a resist covering at least a portion of a substrate, the photolithographic system comprising:

a lens;

a container containing a fluid, the container being located between the lens and resist and comprising:

a top layer that is substantially transparent to the light;

a bottom layer that is substantially transparent to the light; and

at least one side attaching the top layer to the bottom layer.

[c17] 17. A photolithographic system according to claim 16, wherein:

the top layer, the bottom layer and the at least one side are comprised of the same material.

[c18] 18. A photolithographic system according to claim 16, wherein:

the top layer has an absorption of less than about twenty percent of the light and a refractive index greater than 1;

the bottom layer has an absorption of less than about twenty percent of the light and a refractive index greater than 1; and

the at least one side has an absorption different from the absorption of the top layer and the bottom layer and a refractive index different from the refractive index of the top layer and the bottom layer.

[c19] 19. A photolithographic system according to claim 18, wherein the fluid is a liquid having:

a refractive index greater than the refractive index of air; and

substantial transparency to light.

[c20] 20. A method for projecting light through a lens onto a resist covering at least a portion of a substrate, the method comprising steps of:

positioning a container containing a fluid between and in contact with the lens and resist; and

projecting light through the lens, through the container containing the fluid and onto the resist, whereby the contained fluid does not contact the lens or resist.

[c21] 21. A method for projecting light through a lens onto a resist according to claim 20, wherein

the container includes a top layer that is substantially transparent to the light and a bottom layer that is substantially transparent to the light; and

the step of projecting light through the lens, through

the container containing the fluid and onto the resist, includes projecting light through the lens, then through the top layer of the container, then through the fluid contained within the container, then through the bottom layer of the container, then onto the resist.